

AMENDMENT UNDER 37 C.F.R. § 1.116  
U.S. Patent Application No. 09/750,058

**REMARKS**

Reconsideration and allowance of the subject application are respectfully requested.

Upon entry of this Amendment, claims 1-15 are pending in the application. In response to the Office Action, Applicant respectfully submits that the pending claims define patentable subject matter.

**I. Preliminary Matters**

Claims 5-7, 9 and 12 are objected to because of grammatical informalities noted by the Examiner. Further, claim 11 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because the Examiner maintains that variables used in the equation must be more specifically defined. By this Amendment, Applicant has amended the claims to improve clarity. Accordingly, the Examiner is requested to remove the objections and the § 112, second paragraph, rejection.

**II. Prior Art Rejections**

Claims 1-6 and 12-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohkubo et al. (USP 6,021,165; hereafter “Ohkubo”) in view of Cahill (USP 5,150,384) and newly cited Mourot et al. (USP 5,537,438; hereafter “Mourot”). Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohkubo in view of Cahill, Mourot and Chen (USP 5,729,577). Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohkubo in view of Cahill, Mourot and Yonge (USP 6,111,919). Claim 8 is rejected under 35 U.S.C. § 103(a) as being

AMENDMENT UNDER 37 C.F.R. § 1.116  
U.S. Patent Application No. 09/750,058

unpatentable over Ohkubo in view of Cahill, Mourot and Godwin et al. (USP 4,620,069; hereafter “Godwin”).

In the Amendment filed May 20, 2004, Applicant argued that independent claims 1 and 14 should be allowable over Okubo and Cahill because the combined references do not teach or suggest the blocks have an adjustable length which is set to ensure accurate detection of the information signal, the tone or the phase change, as required by amended independent claims 1 and 14. Further, one of ordinary skill in the would not have been motivated to utilize a variable time slot length in an orthogonal frequency-division multiplexed (OFDM) / time division multiple access (TDMA) system such as Ohkubo and Cahill since this would prevent accurate reception of data in the intended time slots (i.e., render the system useless). That is, unlike TDMA where the time slots are fixed in length, the present invention teaches that the block length is adjustable/variable as a function of the signal/noise ratio (SNR) to ensure sufficient accuracy for the signal detection.

In response to the May 20 Amendment, the Examiner now cites Mourot for allegedly disclosing “a method wherein the block length is adaptively changed to ensure accurate detection of the information signal by determination of the channel impulse response in a TDMA system (col. 2, lines 55-67) … [and] overcome problems related to intersymbol interference (col. 1, lines 13-17).” The Examiner further asserts that “it would have been obvious to … to utilize an adaptive block length to ensure accurate detection of the information as taught by Mourot in the

AMENDMENT UNDER 37 C.F.R. § 1.116  
U.S. Patent Application No. 09/750,058

method Ohkubo in view of Cahill because it could advantageously be used to overcome intersymbol interference.”<sup>1</sup>

However, Applicant respectfully submits that Mourot does teach or suggest the features of the claimed invention which are missing from Ohkubo and Cahill. In particular, Mourot does not vary the lengths of the time slots/segments which are assigned to the individual users. Similarly, Cahill simply teaches that the TDMA receiver processes the data in the particular time slots/segments which are assigned to the transmitting radiotelephone and remain fixed in length. Thus, Mourot does not provide any motivation for modifying the lengths of the time slots/segments which are received by the system of Cahill.

The present invention is related to detecting of a tone, a frequency or a phase change in a signal, i.e., in general, to signaling information and in particular, to in-band signaling, which is a different field from the cited documents. However, the object of the invention is to provide a method and a device for such a detection (page 1, third paragraph) which can be carried out with low expenditure. Therefore, it is suitable for monitoring a large number of channels. However, it can also be used for one channel only.

The present invention monitors and evaluates only a portion of the signaling information (rather than the entire signaling information). In accordance with this, the signal is divided in blocks and only some blocks, e.g. every second block, (but not all blocks) are evaluated/examined (the evaluating of the blocks occurring after a transformation from the time domain). This means that information, i.e. blocks which are not processed, is discarded such that

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<sup>1</sup> Office Action at page 5.

AMENDMENT UNDER 37 C.F.R. § 1.116  
U.S. Patent Application No. 09/750,058

less information as provided is evaluated for the detecting operation. The invention realizes, that each block *per se* might carry the information (tone frequency or phase change). Therefore, in order to get enough information from the sequence of blocks, not only one but several blocks, e.g., every second block, are evaluated and the block length needs to be large enough or is adapted (see claims 2 and 8).

As a consequence, the complexity (of computing) is reduced while increasing the detection delay. Complexity or computer power is exchanged by detection delay. (see page 2, last paragraph to page 3, first paragraph of the specification)

The present invention uses the feature that the detecting of the signaling information might not be so much time sensitive. The saved computing power can be distributed, e.g., for monitoring different channels. In this way, it is similar to time division multiplexing. However, while it is simple to distribute the computing power in time to several channels, the same is not true for transmitting more information at the same frequency. The other monitored channels may carry signaling information on the same or different frequency.

On the other hand, TDMA is completely different from the present invention in that TDMA multiplexes information in time division to transmit more information at the same frequency. There is no loss of information, only a different allocating of the information in blocks in time is performed. More information can be transmitted at the same frequency. Consequently, there is no saving of computing power.

Ohkubo discloses controlling of the oscillation frequency of a local oscillator using a broadcast receiver demodulating a phase reference symbol contained in a frequency-division multiplexed broadcast signal. Although Ohkubo discloses transformation from the time to the

AMENDMENT UNDER 37 C.F.R. § 1.116  
U.S. Patent Application No. 09/750,058

frequency domain, the cited reference does not teach or suggest dividing the signal into time segments (blocks) and selecting a predetermined number of blocks to be processed for detection, wherein the blocks which are not selected are not further processed.

Cahill teaches a TDMA method which allows a greater amount of information (e.g., several channels) to be transmitted in a particular frequency band. In TDMA, the information is divided/portioned in time blocks. If the information, e.g., different channels, is demodulated, all the information is used. Cahill teaches a receiver receives a TDMA signal, such as a TDMA composite modulated signal, and reconstructs the original information signal by decoding the TDMA signal transmitted to the receiver in one of the sequential time segments (col. 4, lines 10-30). Accordingly, all blocks (time segments) of an information signal (signaling information like a tone of a frequency or a phase change) are used or evaluated.

Mourot is directed to a system of which determines when to track channel variation. In particular, the reference discloses determining optimal length of a data block contained in the time slot/segment (i.e., multiple blocks may be provided in each time slot) and comparing the determined optimal length to the actual block length in order to determine when to track variations of the channel (i.e., if the optimal length is less than the actual length of the block, tracking of variations of the channel is undertaken).

Accordingly, the Examiner's proposed combination of Ohkubo, Cahill and Mourot does not teach or suggest "dividing the signal into a plurality of blocks corresponding to time segments of the signal, wherein the blocks have an adjustable length which is set to ensure accurate detection of the information signal, the tone or the phase change; [and] selecting a

**AMENDMENT UNDER 37 C.F.R. § 1.116**  
U.S. Patent Application No. 09/750,058

predetermined number of the blocks to be processed for detection, wherein the blocks which are not selected are not further processed", as recited in claim 1 and similarly recited in claim 14.

Accordingly, Applicant respectfully submits that claims 1-14 should be allowable over Ohkubo, Cahill and Mourot do not teach or suggest all of the features of the claims, and one of ordinary skill in the art would not have been motivated to combine and modify the cited references to produce the claimed invention.

**III. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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